

WHAT IS CLAIMED IS:

1. A high frequency substrate comprising at least:

a metal layer;

a dielectric layer formed on the metal layer, wherein the dielectric layer

- 5 has a dense structure and a plurality of voids with a filling material stuffed therein wherein the dielectric constant of the filling material is smaller than that of the dense structure so that the overall dielectric constant of the dielectric layer is smaller than that of the dense structure; and

a high frequency signal transmission line, which is deposited on the

- 10 dielectric layer.

2. The high frequency substrate according to claim 1, wherein the metal layer is a ground plane.

3. The high frequency substrate according to claim 1, wherein the metal layer is a power plane.

- 15 4. The high frequency substrate according to claim 1, wherein a material of the dielectric layer is polytetrafluoroethylene (PTFE).

5. The high frequency substrate according to claim 1, wherein a material

of the dielectric layer is ceramics.

6. The high frequency substrate according to claim 1, wherein a material of the dielectric layer is resins.

7. The high frequency substrate according to claim 1, wherein a material  
5 of the dielectric layer is foaming materials.

9. The high frequency substrate according to claim 1, wherein the filling material is air.

10. A high frequency substrate comprising at least:

a metal layer;

10 a dielectric layer formed on the metal layer, wherein the dielectric layer has a dense structure and a plurality of voids with air stuffed therein; and

a high frequency signal transmission line which is deposited on the dielectric layer.

11. The high frequency substrate according to claim 10, wherein the metal  
15 layer is a ground plane.

12. The high frequency substrate according to claim 10, wherein the metal

layer is a power plane.

13. The high frequency substrate according to claim 10, wherein a material of the dielectric layer is polytetrafluoroethylene (PTFE).

14. The high frequency substrate according to claim 10, wherein a material  
5 of the dielectric layer is ceramics.

15. The high frequency substrate according to claim 10, wherein a material of the dielectric layer is resins.

16. The high frequency substrate according to claim 1, wherein a material of the dielectric layer is foaming materials.

10 17. The high frequency substrate according to claim 1, wherein a material of the dielectric layer is heat-resistant materials.

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